

SECTION 2C – 5 - PREPARATION OF PLAN AND PROFILE SHEETS

DRAFTING

All drafting will be accomplished in accordance with the CADD Users Guide. Care must be taken by the engineering technician to clearly distinguish items. Items of great importance should stand out over those of lesser importance. A proposed drainage structure should readily be obvious as to its location by plotting the structure to scale, clearly showing construction baseline stationing and clearly showing the skew, if any, the flow arrow and the description. It is important that the complete description of the existing structure not be obliterated by the proposed information. Where items of this nature conflict with proposed items, it is most important that the information be moved to a suitable location where it can be readily distinguished. Therefore, the need for legibility, clarity and neatness cannot be over emphasized.

IDENTIFICATION

The first items to be shown on plan sheets are the applicable **project numbers** in blocks in the upper and lower right corners of the plan and profile sheets. The names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By: (L&D Survey Office Manager or Consultant Survey Project Manager), Design Supervised By: (Responsible Person)* and Designed By:(Designer)

NUMBERING

Plan sheets are to be consecutively numbered beginning with "3". Match sheets for connection extensions, etc., are to be numbered "3B", etc., with the number corresponding to the applicable mainline plan sheet and the letter "A" reserved for the mainline profile sheets.

LAYOUT

Interstate, Arterial, Primary and Secondary plans are normally plotted on a scale of 1"=50' Imperial (1:500 Metric). Urban projects or other complex projects are to be plotted on a scale of 1"=25' Imperial (1:250 Metric). Plan sheets must be laid out with **mainline stations** increasing from left to right on the plan sheet. Anticipated proposed construction should be as near vertically centered as practicable, considering interchanges, connections, drainage, etc., with 28 inch (750 mm) lengths along the construction baseline for the proposed highway. Plan sheets are to be spaced longitudinally in order to show intersections entirely on one sheet where feasible and as much as possible of interchanges. A reasonable space, approximately 16 inches (400 mm) if feasible, is to be allowed at the beginning of the first plan sheet and at the end for the last plan sheet for possible extensions.

* Rev. 7/09

SURVEY BASELINE

All survey baselines are to be shown in accordance with CADD Standards. Circles are to be shown at each intersection point of two or more survey lines, having these points as the center. **Station marks** are to be shown at 100 feet (20 meter)-Rural, and 50 foot (10 meter)-Urban intervals, perpendicular to the survey baseline and extending approximately $\frac{1}{10}$ inch (3 mm) left and right. The **500 feet (100 meter) station marks** are to be labeled with the station number equal distances to the left and at a distance adequate to clear anticipated proposed right of way. The last digit of the intermediate station is to be shown close to the station marks. (Imperial only)

MATCH LINES

Match lines are to be shown perpendicular to the construction baseline at even construction stations. **Stations and adjacent sheet number are to be shown*** at the beginning and end of each applicable plan sheet and at necessary points on connection and traverse baselines.

BEARINGS

Bearings are to be shown on each tangent or sub tangent segment on each plan sheet. If a tangent line extends for over half the length of the plan sheet, the bearing should be shown twice at equal intervals. Bearings should be shown so as not to conflict with station marks.

CURVE DATA

T.S.'s, S.C.'s C.S.'s, and S.T.'s on curves with spirals and P.C.'s and P.T.'s on curves without spirals are to be **labeled along lines** projecting from these points toward the center of the curve at a distance from the baseline adequate to clear anticipated proposed items and topography. P.R.C. lines may be projected toward either curve center point. Labeling is to be at an adequate distance from the baseline to clear anticipated proposed items and topography. **Remaining curve data** (degree; tangent; length; radius; curve stations) are to be shown on the inside of the curve, centered longitudinally and lettered along imaginary lines parallel to a line that would be tangent to the mid point of the curve. This data is to be shown as closely to the baseline as practicable, but beyond anticipated proposed items and topography. **Complete curve data** is to be shown on each sheet on which any portion of the curve appears. Curve data, including stations may, if necessary due to congestion, be located in other appropriate areas of the plan sheet. In these cases, the curve itself and the data are to be identified with **a number** ("1", "2", "3", etc.) inside a $\frac{1}{4}$ inch (6 mm) circle for existing and $\frac{5}{16}$ inch (8 mm) circle for proposed curve data.

* Rev. 7/09

REFERENCE POINTS

Reference points are contained on a survey data sheet (containing the project's horizontal survey alignment), which is furnished by the survey processing unit.

REFERENCE BLOCK*

A Reference Block is to be shown in the lower right corner of the plan sheet to designate the location of detail sheets associated with the plans (i.e.- plan profiles, entrance profiles, drainage descriptions sheets, etc.).

NORTH ARROW

A [North Arrow](#) is to be shown on each plan sheet in a conspicuous location.

SCALE

A [bar scale](#) is to be shown in the lower right corner of each plan sheet.

TOPOGRAPHY

All existing topography provided by the electronic data collector is to be accurately plotted on the plans. Care must be exercised in turning right angles from the baseline in plotting items by station plus and distance. Any angles used for plotting purposes are to be turned by tangent offsets. [Station pluses and distances](#) are to be shown on the plans for items of great importance (such as property corners, iron pins, etc.) In critical areas, distances only are shown to other items of topography (such as the closest corner of buildings in critical areas are to be shown similarly. All [existing drainage structures](#) are to be shown similarly. All existing drainage structures are to be plotted to scale and noted with all available information such as size, materials, invert elevations, etc. [Flow arrows](#) are to be shown for all labeled, generally perpendicular to the baseline. An effort must be made to keep this lettering close enough to the item to readily identify it, but beyond anticipated proposed items.

UTILITIES

All available existing utility information is to be shown on the plans. Overhead utility lines, except for high voltage transmission lines, are not to be shown. It is extremely important that all invert and rim elevations for sanitary sewer manholes (SMH) be shown. A [note](#) is to be shown in the upper left corner of the plan sheet listing owners of each utility shown on that sheet. The designation for all underground utilities should be shown frequently on the plans to easily identify the type of underground utility. At connecting roadways or other points where gravity sanitary sewer facilities leave the project corridor, it is essential to show the next manhole with its elevations.

* Rev. 7/06

RIGHT OF WAY

All existing right of way acquired in fee will be shown on plans as established by the survey information or other data. The plans should not designate prescriptive or statutory right of way as existing right of way. It is not necessary to show entire property boundaries on plans. Property lines and lot lines are to be plotted from the information provided by the Electronic Data Collector, property data, and in conjunction with separately drawn plats as furnished with other survey information. All available information is to be shown on the plans in this respect (bearings, distances, lot numbers, all data used for plotting, etc.). This information is to be individually labeled, whether "survey" or "plat" information. **Property line symbols** are to be shown on all property lines. **Property owners' names** are to be shown in conspicuous locations within each applicable property, along with **deed book numbers, page numbers, and total acreages**. Distances, bearings and curve information (**metes and bounds**) are to be shown for the entire periphery of take on all properties owned by U.S. and state agencies; National Forests; Railroads and Power Companies.

ROAD AND STREET NAMES

Road and street names are to be shown on plans and in correspondence in addition to route numbers. The name is to be shown below the route number block in the upper right hand corner of all plan sheets and, if feasible, the name is to appear within the roadway limits.

Otherwise, the name is to be shown on the plan sheet in close proximity to the road or street. This procedure is of particular value to field personnel and area residents who can more easily identify existing thoroughfares by road or street names rather than by route numbers. Individual lot numbers, where assigned, are to be shown in cities, towns and built-up areas. If lot numbers have not been assigned, the block numbers should be prominently shown. Lot numbers should be shown within the limits of the building, if possible. If not, they should be shown as close to the buildings as practicable.

SITE PLANS

Site plans for developments to be constructed during the plan development process will not be shown on roadway plans until the development construction is complete and the site has been surveyed in the field.

PLOTTING OF PROFILE SHEETS

Profile sheets are to be plotted at this stage using the base sheet available from the Automated Engineering Section and in accordance with the following:

IDENTIFICATION OF ITEMS ON THE PROFILE SHEETS

The first items to be shown on the profile sheets are the applicable [project numbers](#) in the preprinted blocks. The names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By: (L&D Survey Office Manager or Consultant Survey Project Manager), Design Supervised By: [\(Responsible Person\)*](#) and Designed By:(Designer)

NUMBERING OF PROFILE SHEETS

Profile sheets are to be [consecutively numbered](#) beginning with "3A", with the numerical digit corresponding to the applicable plan sheet. Profile sheets for connections, ramps, etc., are to be appropriately numbered and lettered with numerical digit corresponding to the mainline plan sheet.

PROFILES

Stationing of profiles is to match the station of the applicable plan sheet. [Station numbers](#) are to be shown in the space provided immediately below the ruled portion of the sheet. [500 feet \(100 meters\) stations](#) and the first and the last stations on all sheets are to be shown in their entirety. Only the last digits of other stations are to be shown. Applicable elevation data information is to be shown in the upper left corner of the first profile sheet. Normally, the vertical scale of the profile sheet is 1"=10' Rural (1:100-Metric), 1"=5' Urban (1:50-Metric). Elevations are to be shown in the spaces provided both left and right at 10-foot (2 meter) intervals on the heavy ruled lines. Elevations are to be shown to encompass the high and low extremities of the profile line. The profile line is to be centered vertically as nearly as practicable; allowing space at the bottom of the sheet for proposed finished grade elevations. A profile line of the existing terrain is required for each construction baseline shown on the plans. Existing terrain profiles for survey baselines are to be shown where deemed appropriate by the designer and shown as long dashed lines. [Profile lines](#) are to be plotted at appropriate intervals, whether or not a cross section is taken at the particular plus or not, except for drainage sections reflecting flow line elevations, which are not to be shown on the plans. [Profile lines](#) are to be plotted as a solid line with straight segments connecting the plotted points. Connection route numbers, street names, railroads, etc. are to be labeled at appropriate stations along the mainline profile. Where individual profile sheets are required for connections, etc., the connection route number and street name is to be clearly shown in the upper right corner of the sheet.

* Rev. 7/09